THERMO TROPICS

Discipline the City

Thermotropics

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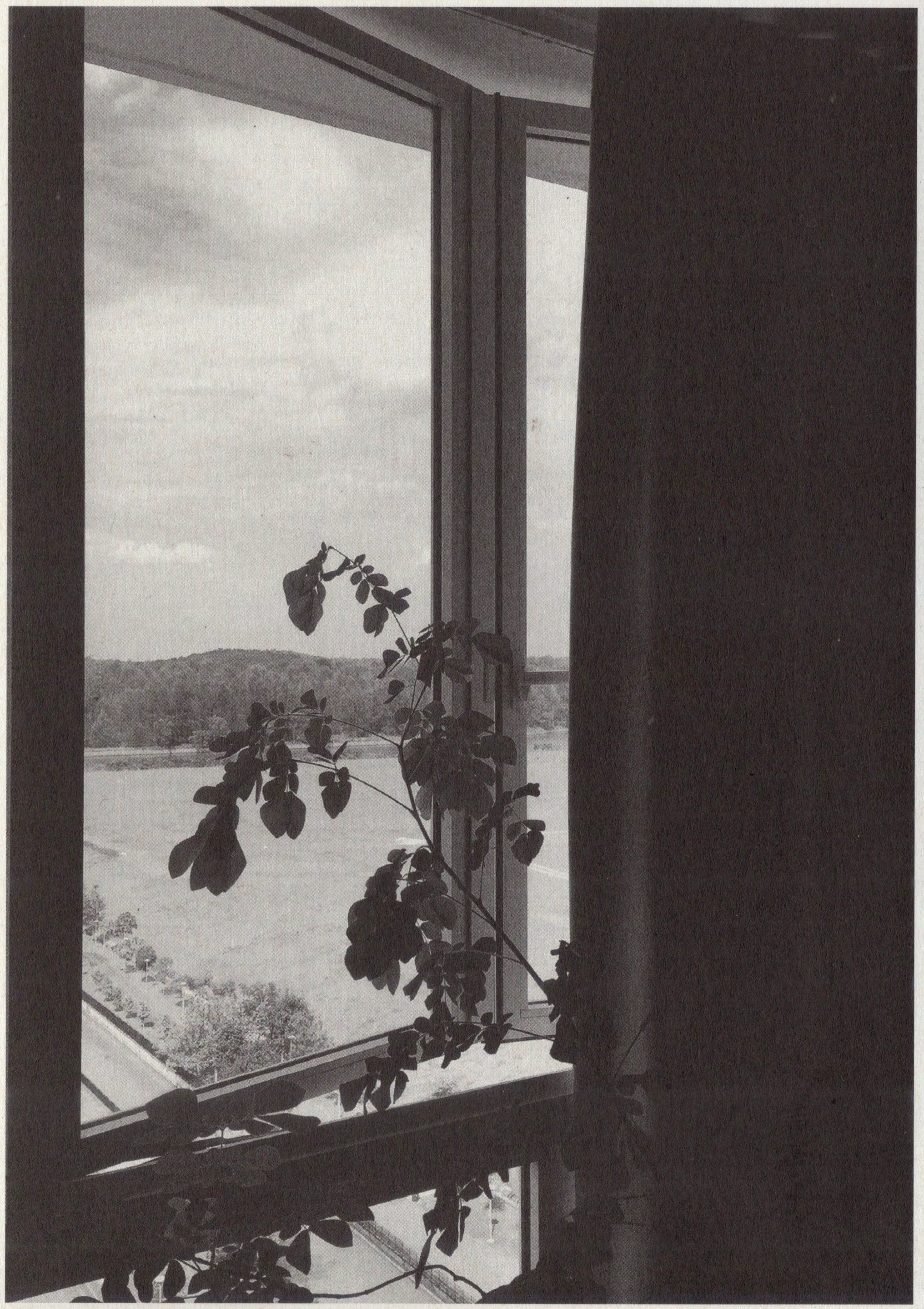


Introduction

thermotropism
ˌθəːmə(ʊ)ˈtrəʊpɪz(ə)m/
noun
BIOLOGY
1. the turning or bending of a plant or other organism in response to a directional source of heat.

In tropical Singapore, the weather is an omnipresent disciplinarian. In response, the body has developed a set of sensing and coping mechanisms. These include moving in the shadows of buildings, sticking closely to mall entrances for an accidental blast of air-conditioning, or using various props to shelter ourselves from the sun.

These mundane, almost unthinking, actions suggest an array of complex yet subtle intentions to regulate one's temperature while maintaining public decorum. In fact, by breaking down the patterns of heat-avoidant actions, this study encounters a wide variety of responses that attest to the ingenuity (and desperation) of the pedestrians.

Spontaneous responses to the heat are a form of adaptive behaviour. Every time we uncover opportunities within the built environment that help mitigate the discomfort from the weather, wisdom accumulates. As a result, we develop a myriad of thermal strategies — ranging from small reflexive movements to elaborate detours — within the city.

Urban planning and architecture play an important part in this phenomenon. Many buildings blindly worship the thermal-neutral, sense-dulling climate that air-conditioning provides, while most outdoor environments remain sweltering and unsheltered. Moving from one building to another, encountering alternate blasts of cold and hot air, pedestrians are the victims of the city's thermal neglect of its public spaces.

Observations

Hand Visor

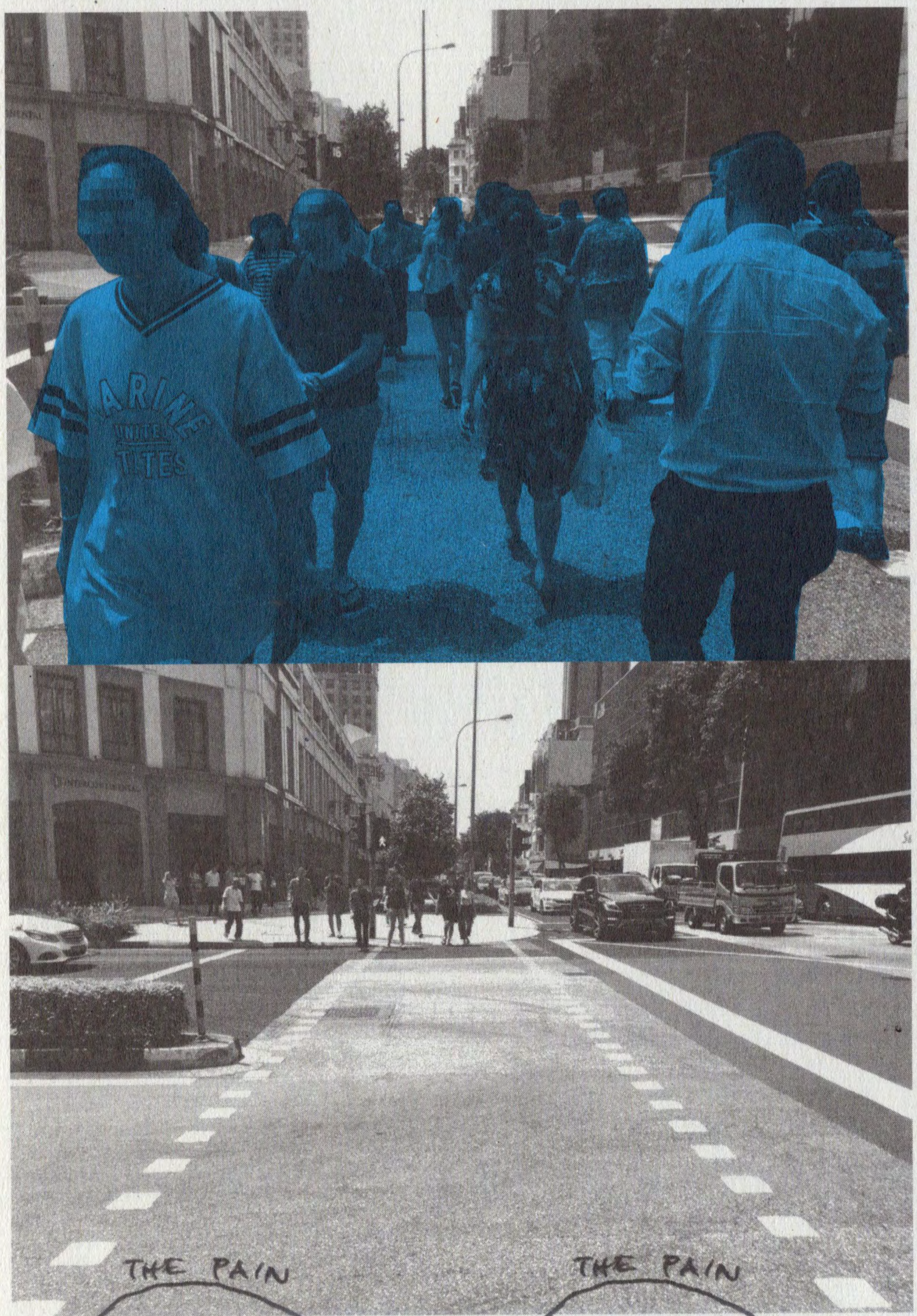
The 'hand visor' is probably one of the most natural and instinctive gestures people make while they transit from a shaded space into the open. Here, a woman is seen using her hand as a visor for the short distance between two shaded areas.

Looking Away

Another alternative to shielding one's eyes from direct sunlight is simply facing the other way.

Good Crowd

On sunny days, the eyes squint from the light bouncing off the pavement, buildings and windows. The presence of fellow pedestrians softens the harshness of the heat and glare. Sunlight gets absorbed and dispersed by bodies, movement and clothing — so being in a crowd actually makes one feel a little less hot.

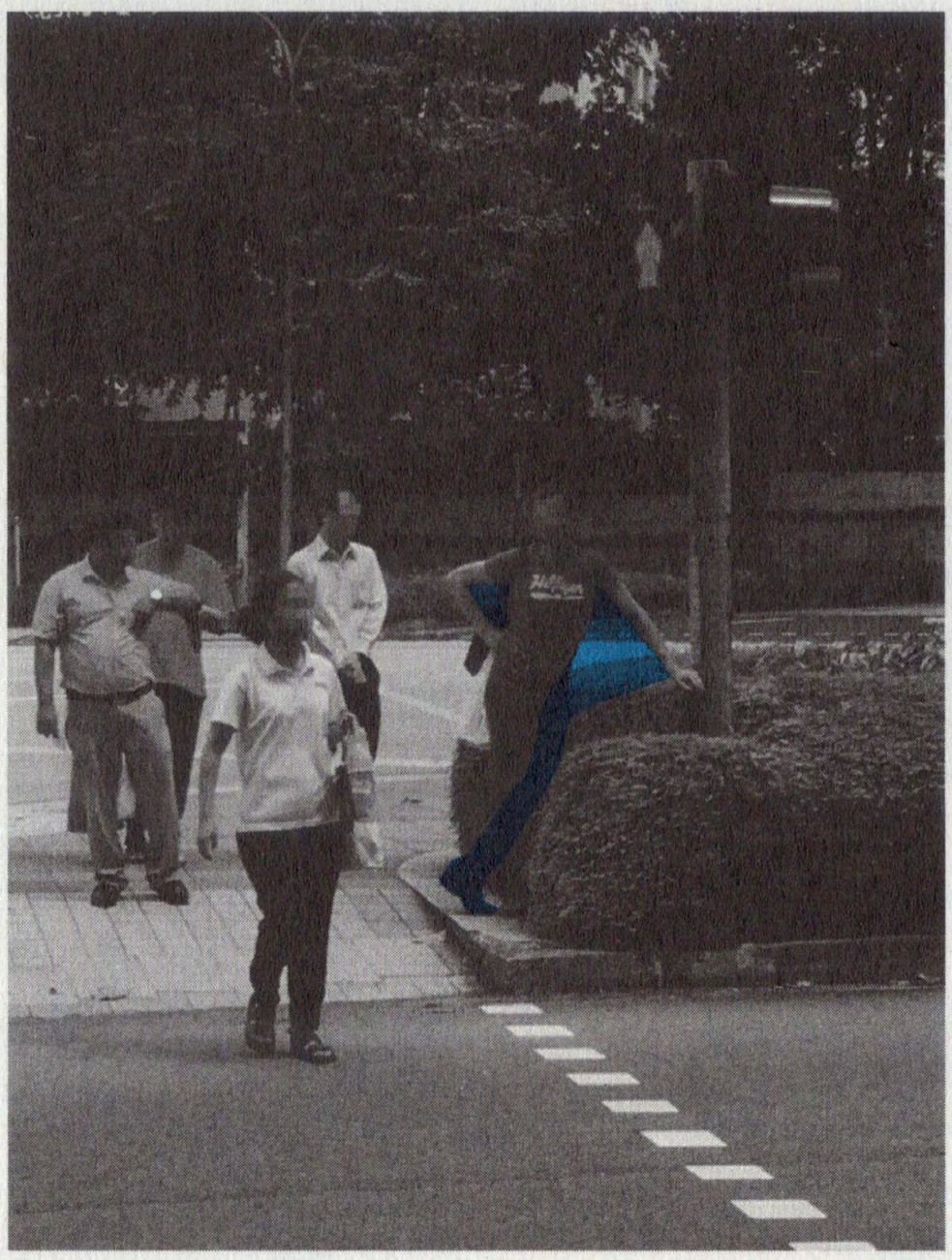


Hands on Hip

Keeping your arms akimbo is one of the most socially acceptable postures to introduce ventilation to the underarm area. In one of the images, a lady demonstrates an uninhibited variation that is best described as 'Hands On Head'.

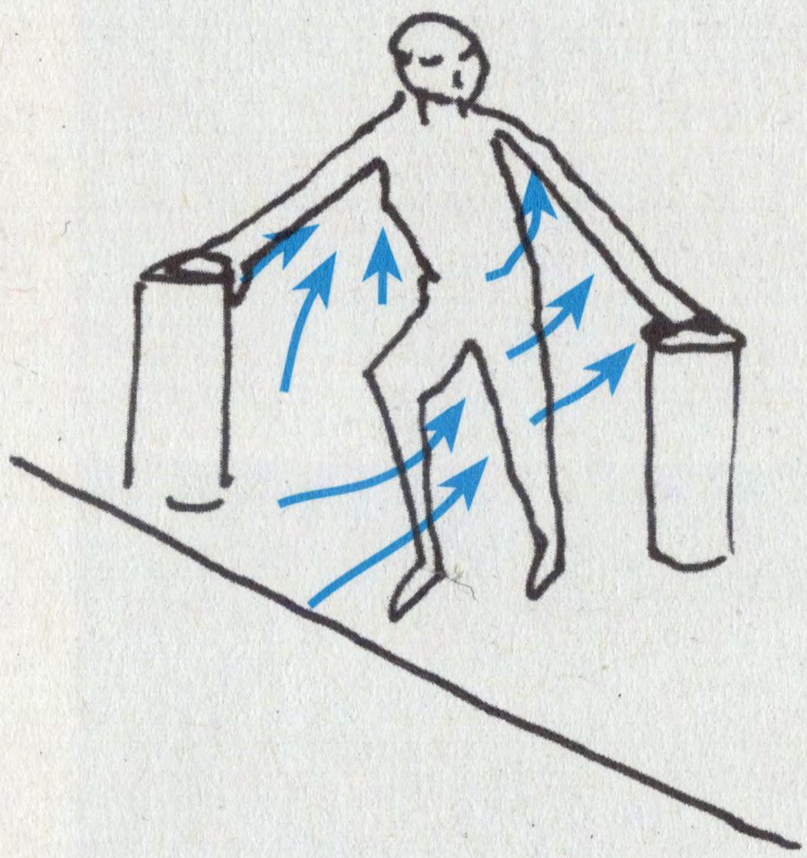
Lean Post

A pedestrian pressing the green-man button moments ago decides to remain in this position, ventilating his armpit while supporting the weight of his upper body on the traffic light. This pose helps relieve tired lower limbs, allows better blood circulation and produces an overall sense of 'relaxation', an intangible but crucial element to beating the heat.



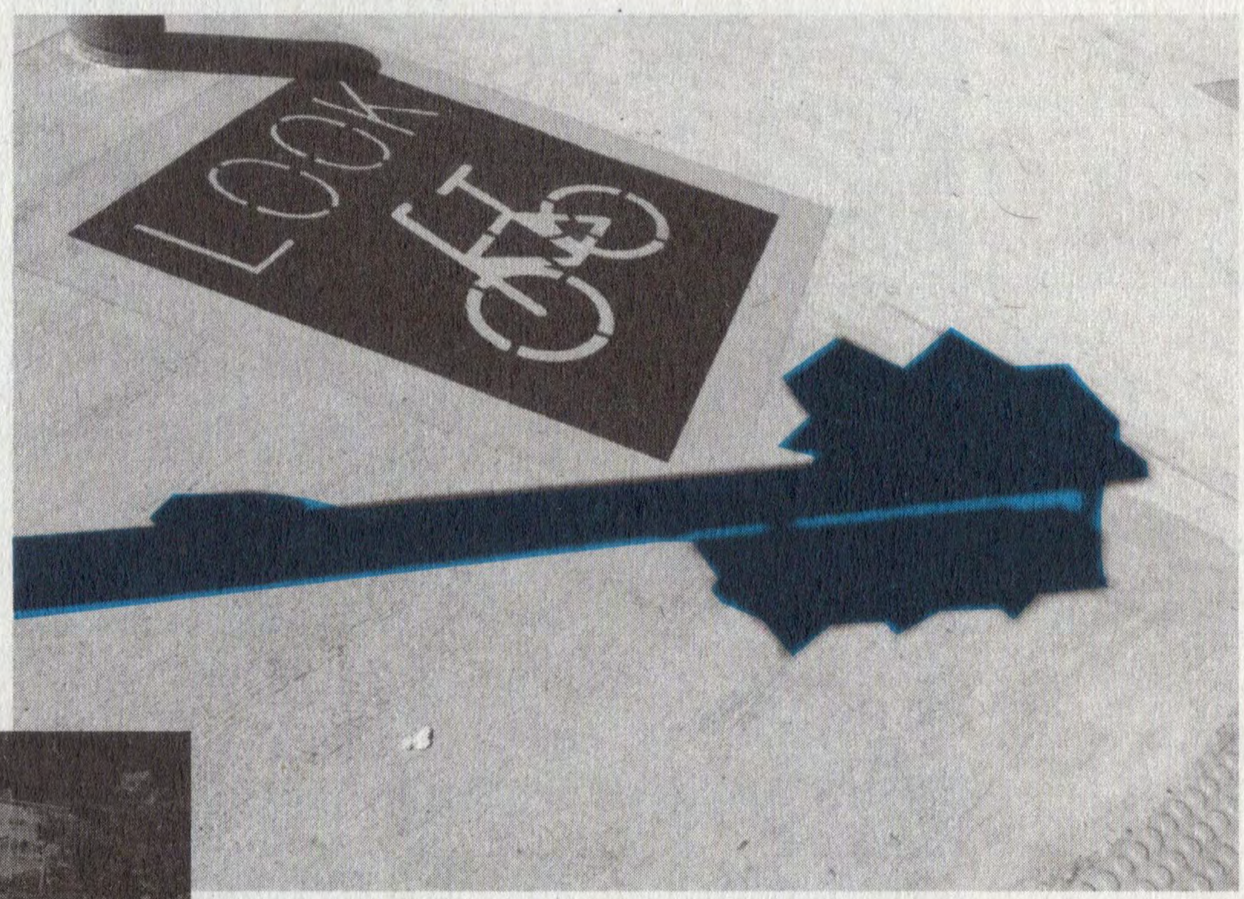
Bollard Bend

Besides tall traffic posts, low and sturdy bollards near road crossings afford a leaning posture that 'spreads open' the body for optimal air circulation.



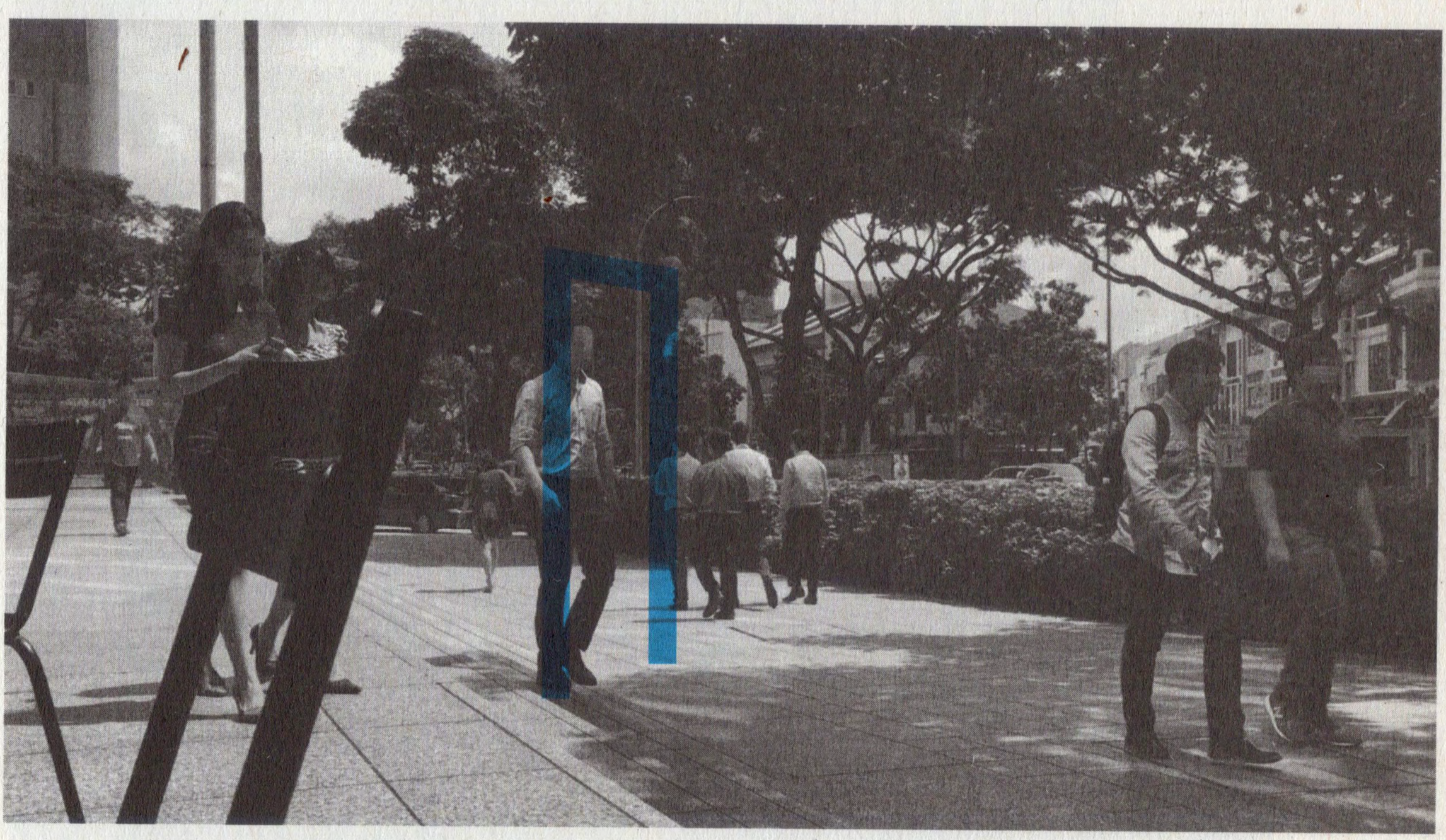
Skinny Shade

In the absence of trees at traffic junctions, one can find a sliver of shade in the shadow of lamp posts or traffic lights. Unless one is extremely small or thin, these skinny shadows cannot cover the entire surface area of the body, but it is possible to position oneself sensibly to protect key bodily zones. Notice how a woman manages to keep her head completely within the shadow from an adjacent traffic light while the rest of her body remains exposed to the sun.



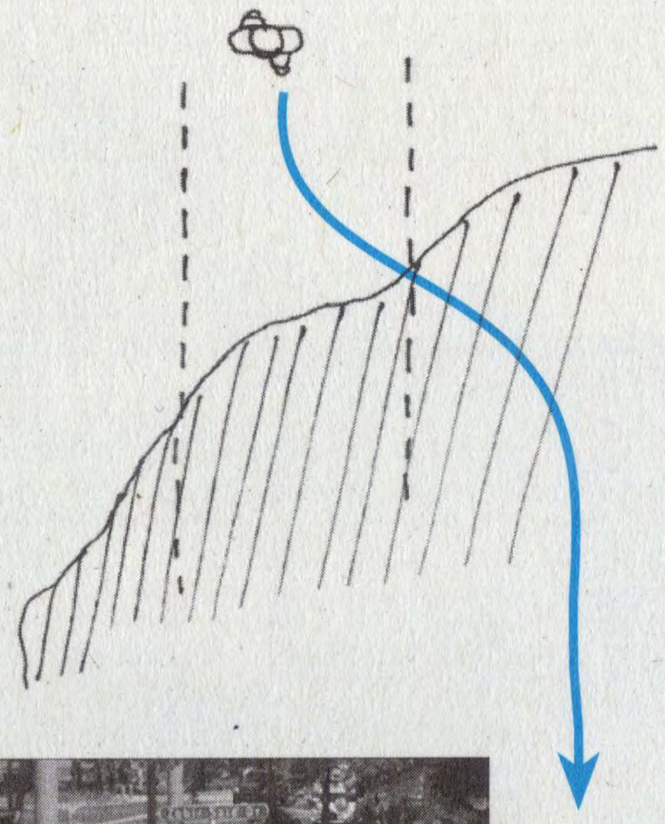
Doors on Shadows

While walking, pedestrians subconsciously scan the ground for shadows. In the image, the long arm of a large shadow indicates a clear entry point. What appears to be a randomly-shaped shadow actually has its own prescribed entry and exit points that are universally understood.



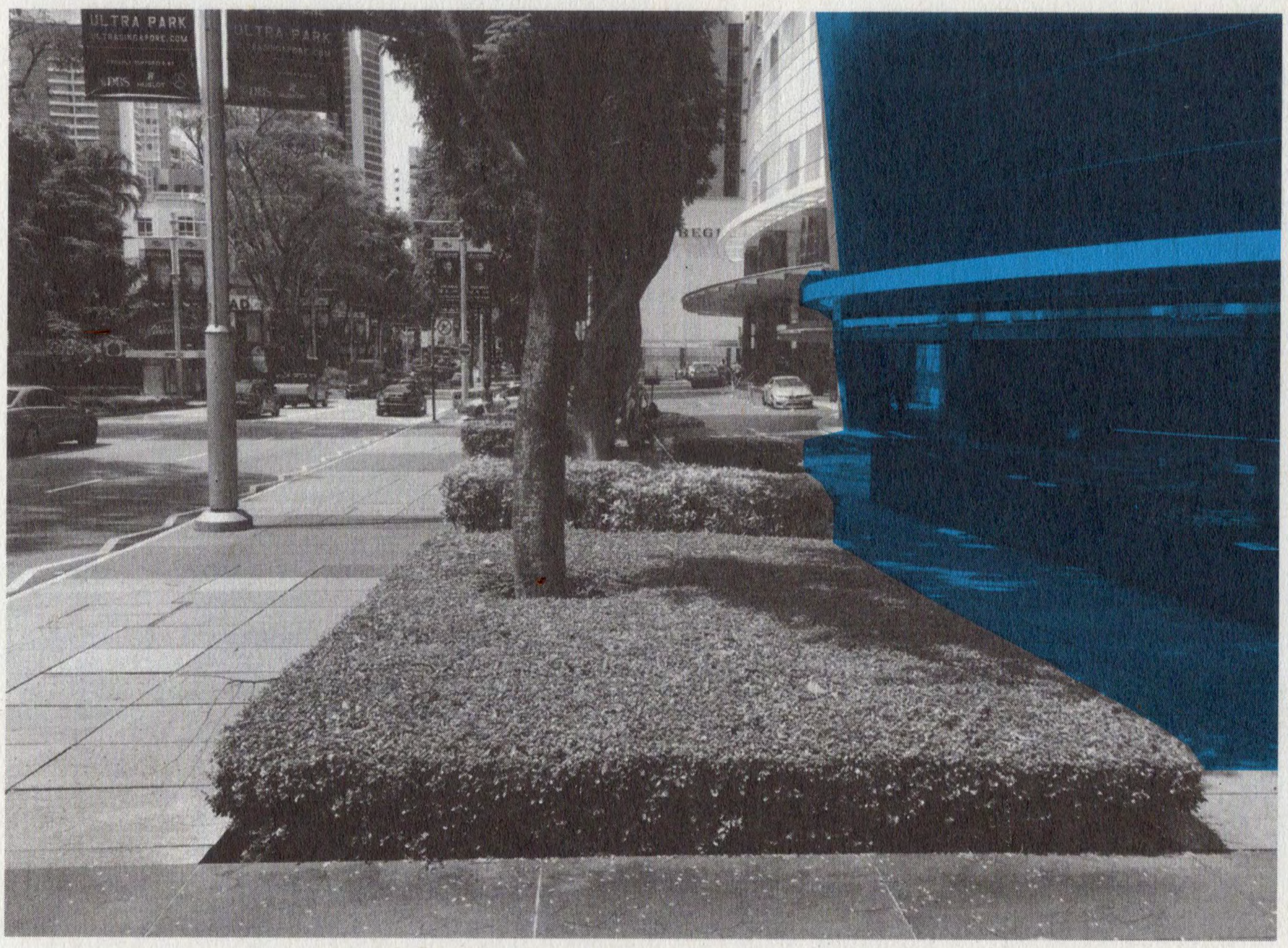
Cool Attraction

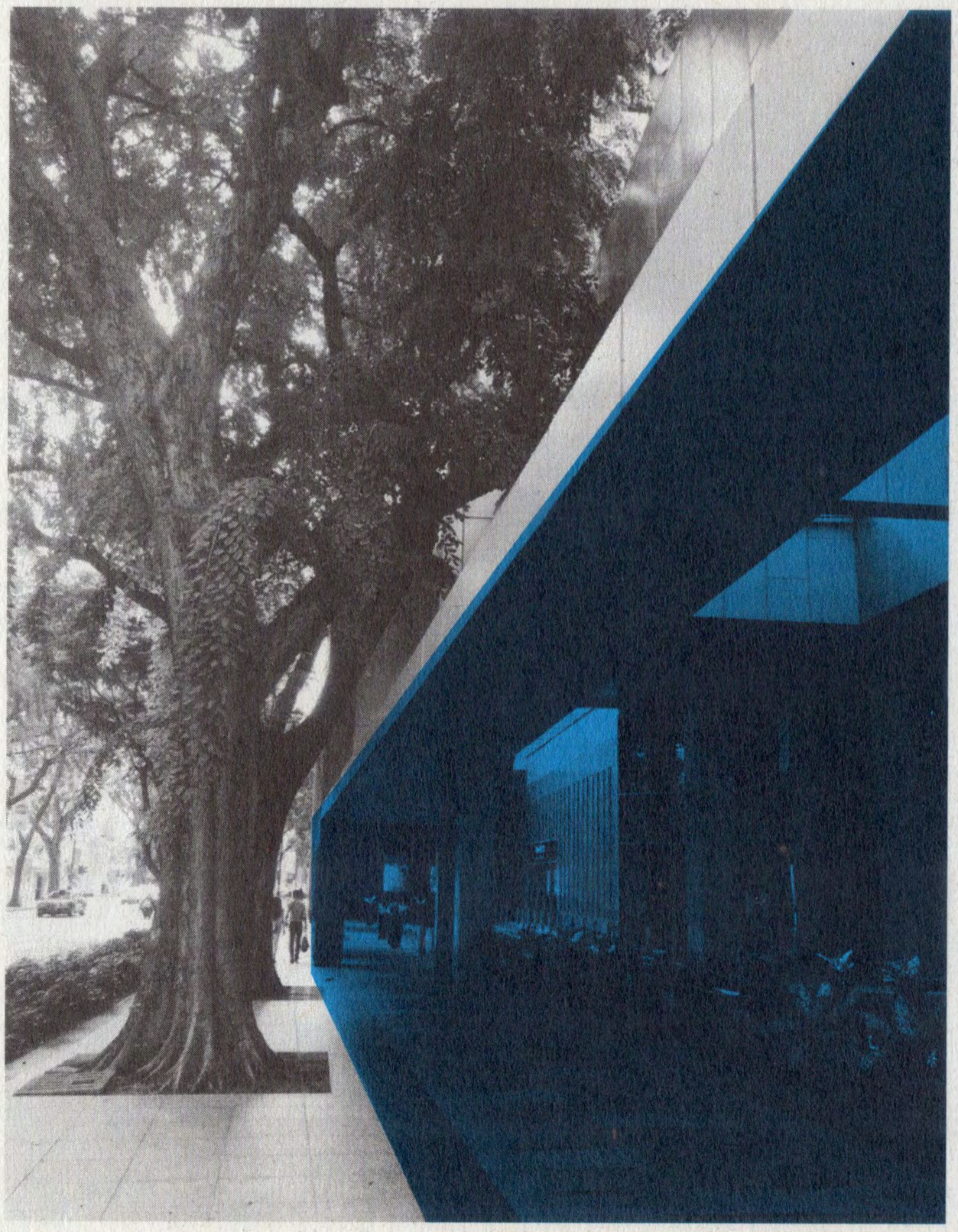
Trees are natural shade producers. They also influence pedestrian paths by the transient shadows they cast over existing infrastructure. In this sequence of images, we see a lady slowly breaking the expected straight walking course, intentionally passing under the shade from the traffic light (see Skinny Shade) for half a second of coolness before completing the diversion by entering a very inviting shadow cast from a large tree nearby.



Building Conspiracy

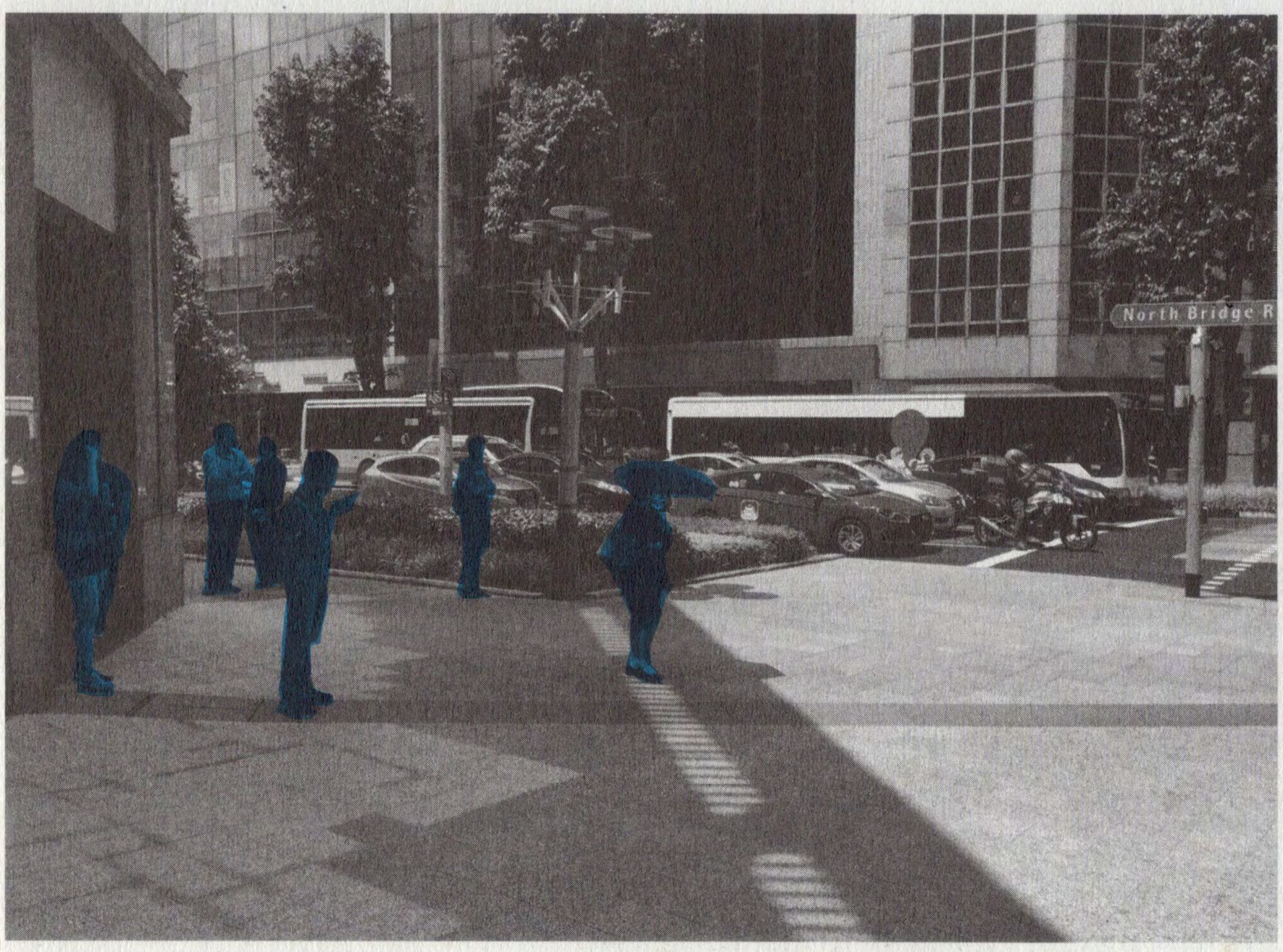
We have observed that the shade provided by trees affects pedestrians' movement. Trees planted outside buildings collude with the architecture to determine walking behaviour by channeling human traffic from tree-shaded paths into building porticos and entrances, where cool air drifts out seductively.





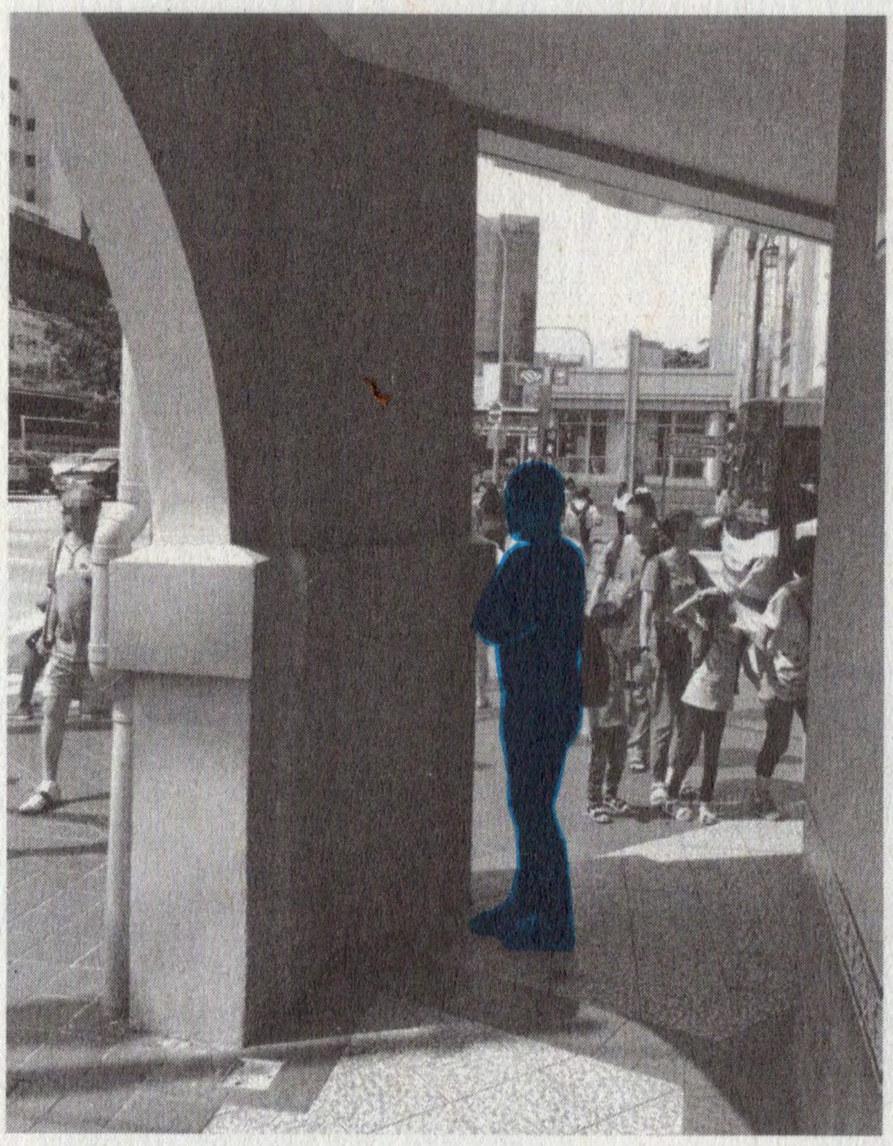
Hard Shade

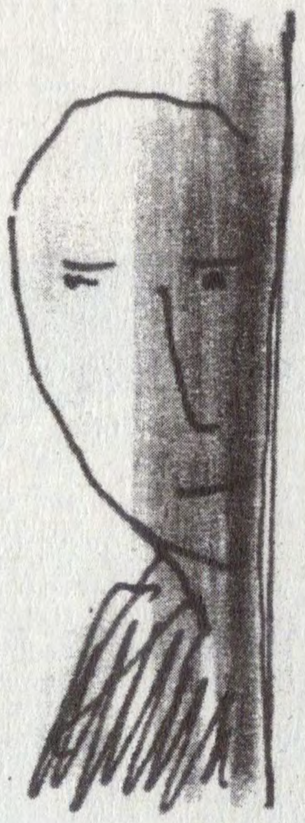
Throughout the day, a building's shadow grows and shrinks in response to the sun's position in the sky. Sometimes, a long shadow can provide a more spacious and well-ventilated waiting area than within building porticoes.



Sun Block

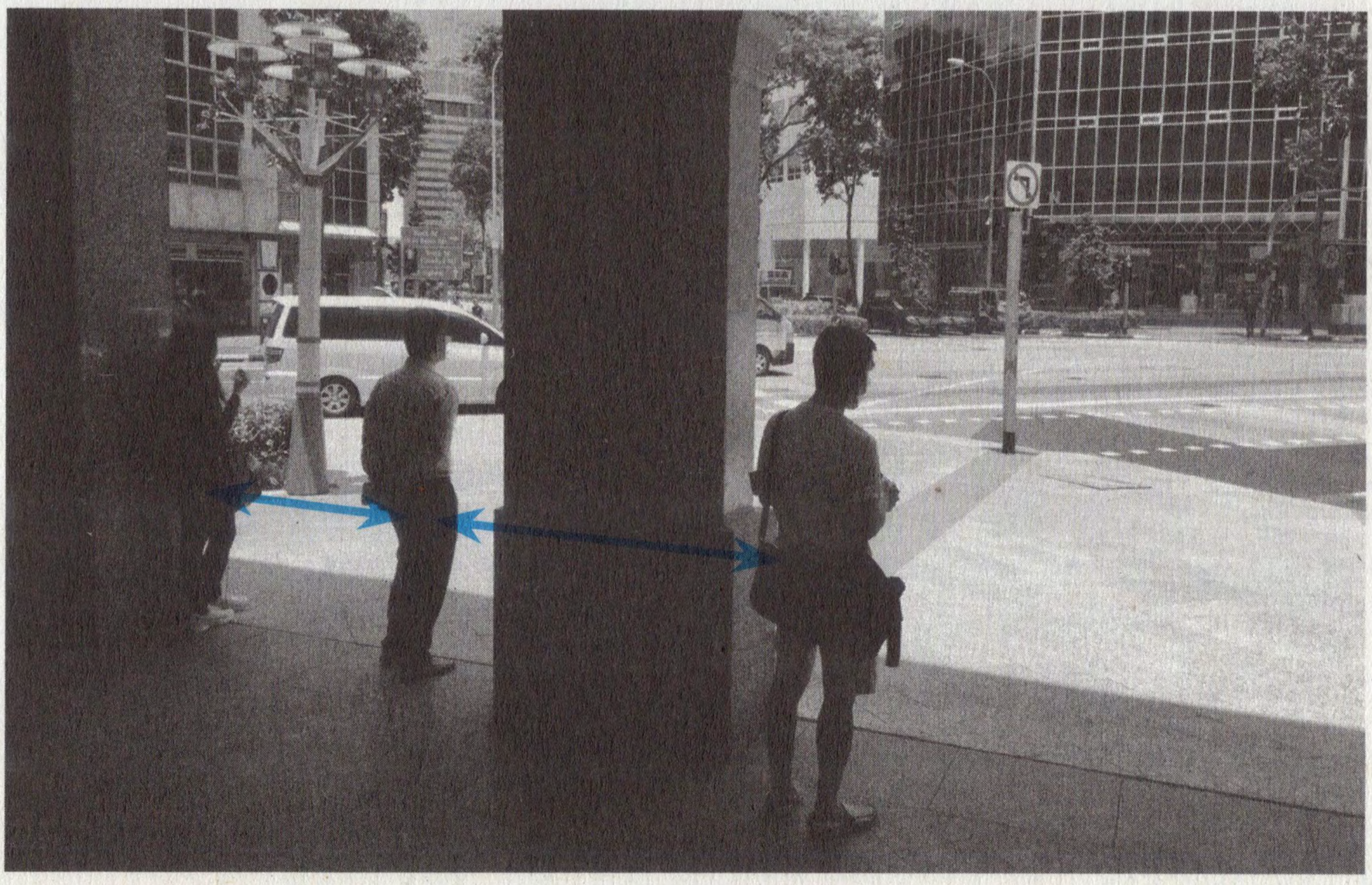
In the tropics, one need not be directly under the sun to feel the heat. Even in shaded areas, the senses are assaulted by visual glare and the mugginess of the air. That is when you need a physical block in the form of building pillars. They produce wide vertical shades that are effective shields.





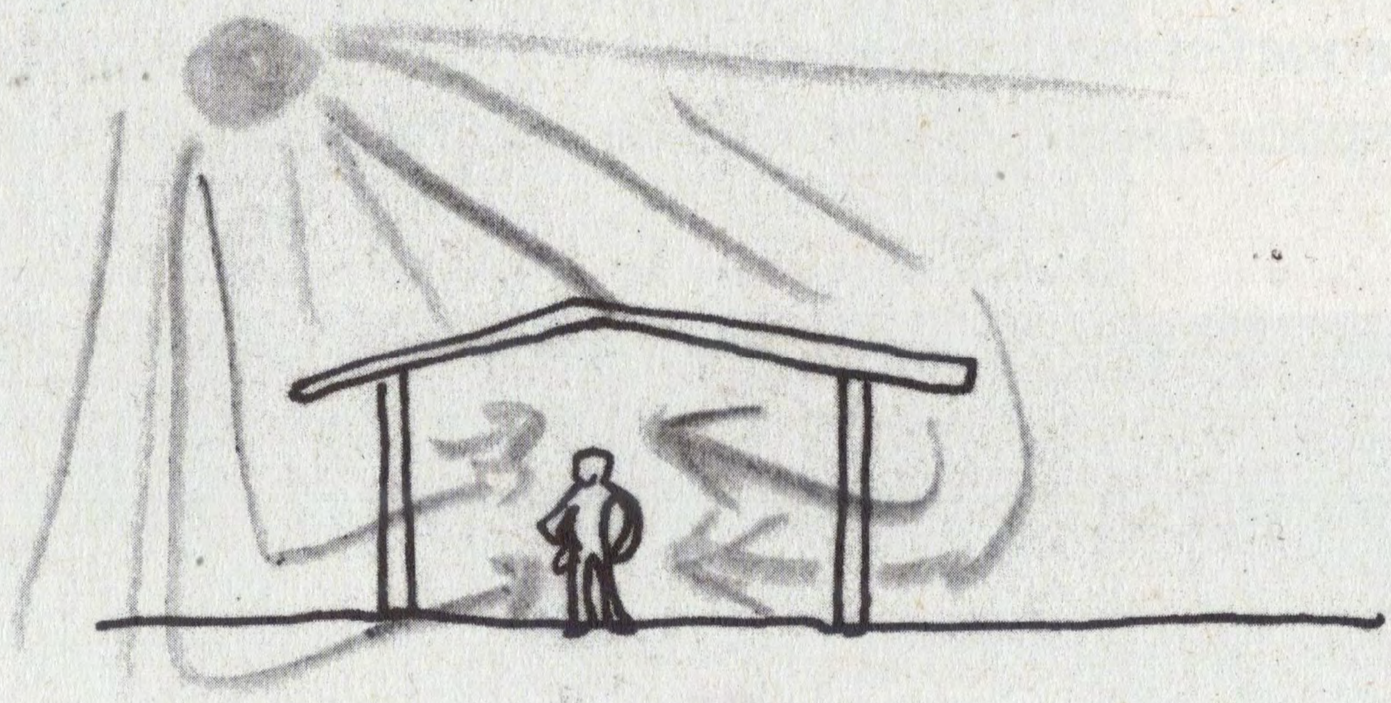
Space Out

The natural inclination to stand near pillars inadvertently leads to an arrangement of pedestrians standing (more or less) equidistance while waiting. This unintended production of empty space allows air to circulate around each individual body.



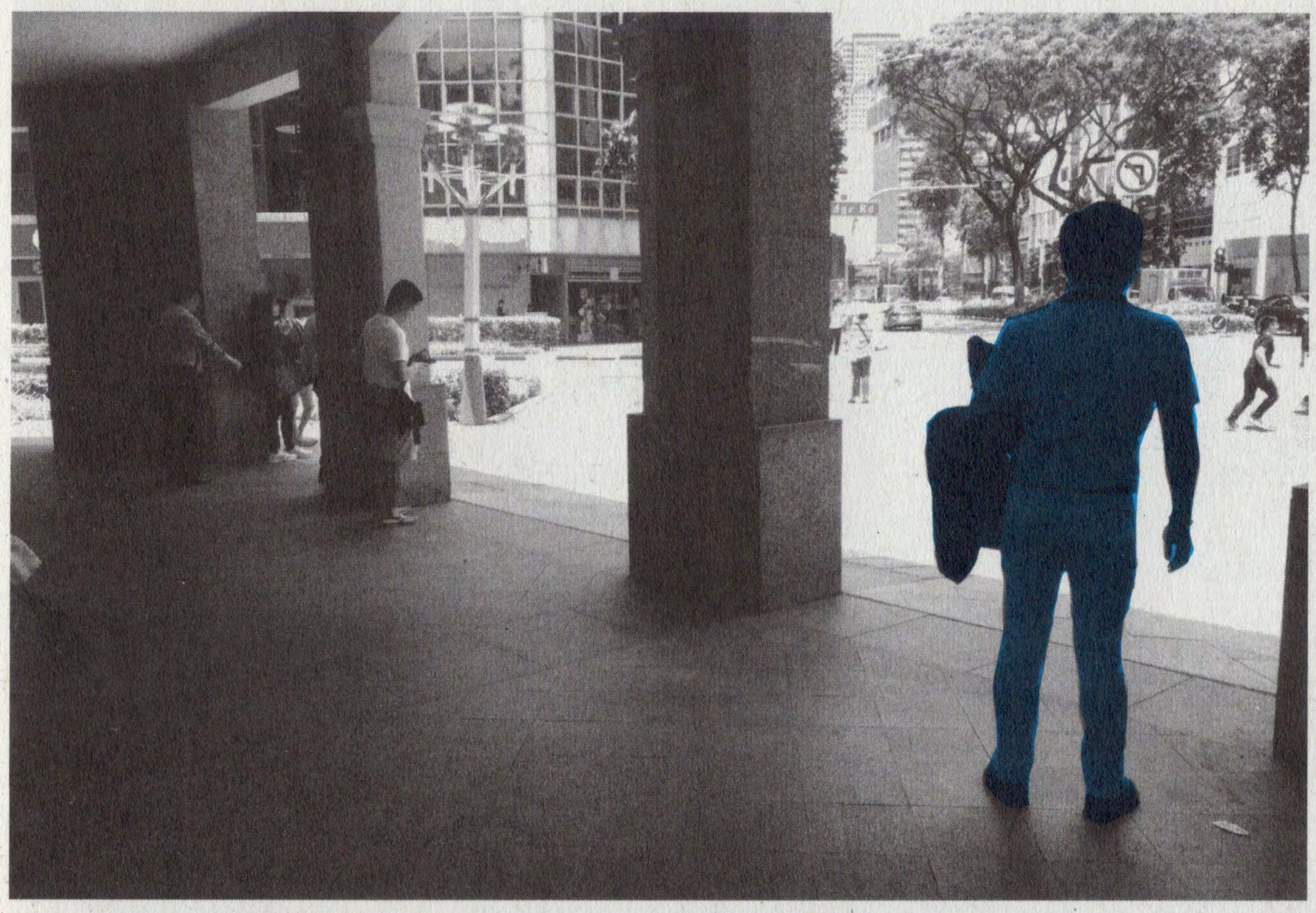
Step Back

By accident or design, buildings near traffic crossings occasionally shade pedestrians while they wait for the lights to change. The question is: Where to position ourselves? Do we stand near the outer edge, searing our eyes with the sunlight reflected off the ground, and charge forward the moment the light turns green? Or should we hide in the deepest, darkest parts of the portico, but suffer the rude contrast of blinding glare and unbearable heat when we step back out again?



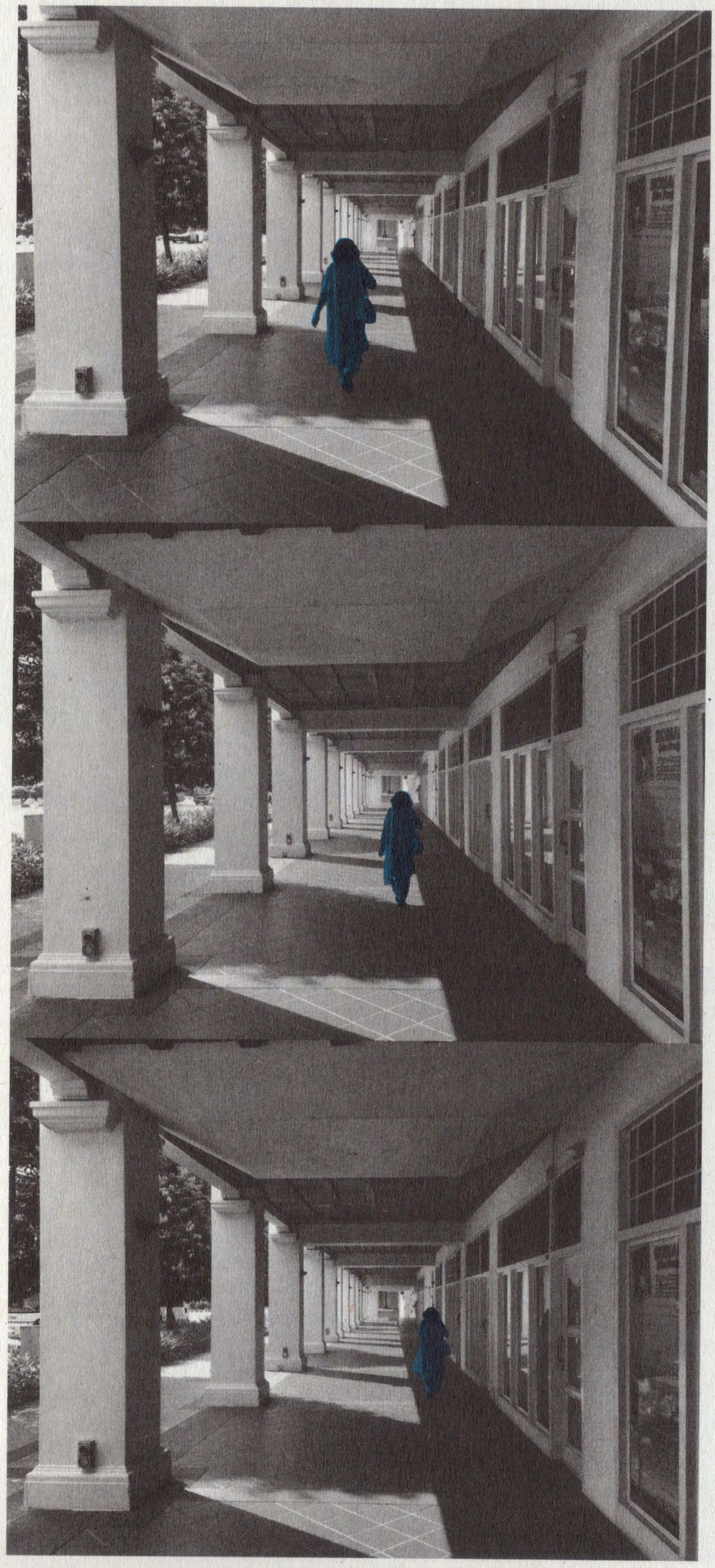
Best Spot

The portico provides a solid, opaque shield from the sun that generally works well throughout the day, with the additional bonus of rain cover. While reliable, the portico has its own microclimate to which pedestrians should be sensitive, as knowledge of these thermal variations can mean a significant increase in comfort. In the following images, we see examples of how to use a portico optimally by positioning oneself a distance away from the edge of the sunlight cast on the ground, standing near or by a pillar to shield oneself from the sun's radiation (see Sun Block) and lastly, directing one's line of sight downwards to decrease glare to the eyes.



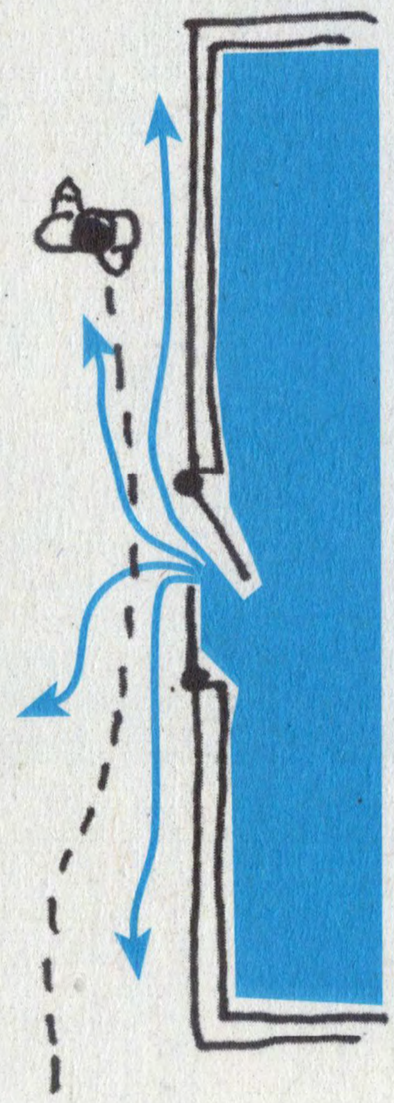
Cool Walking

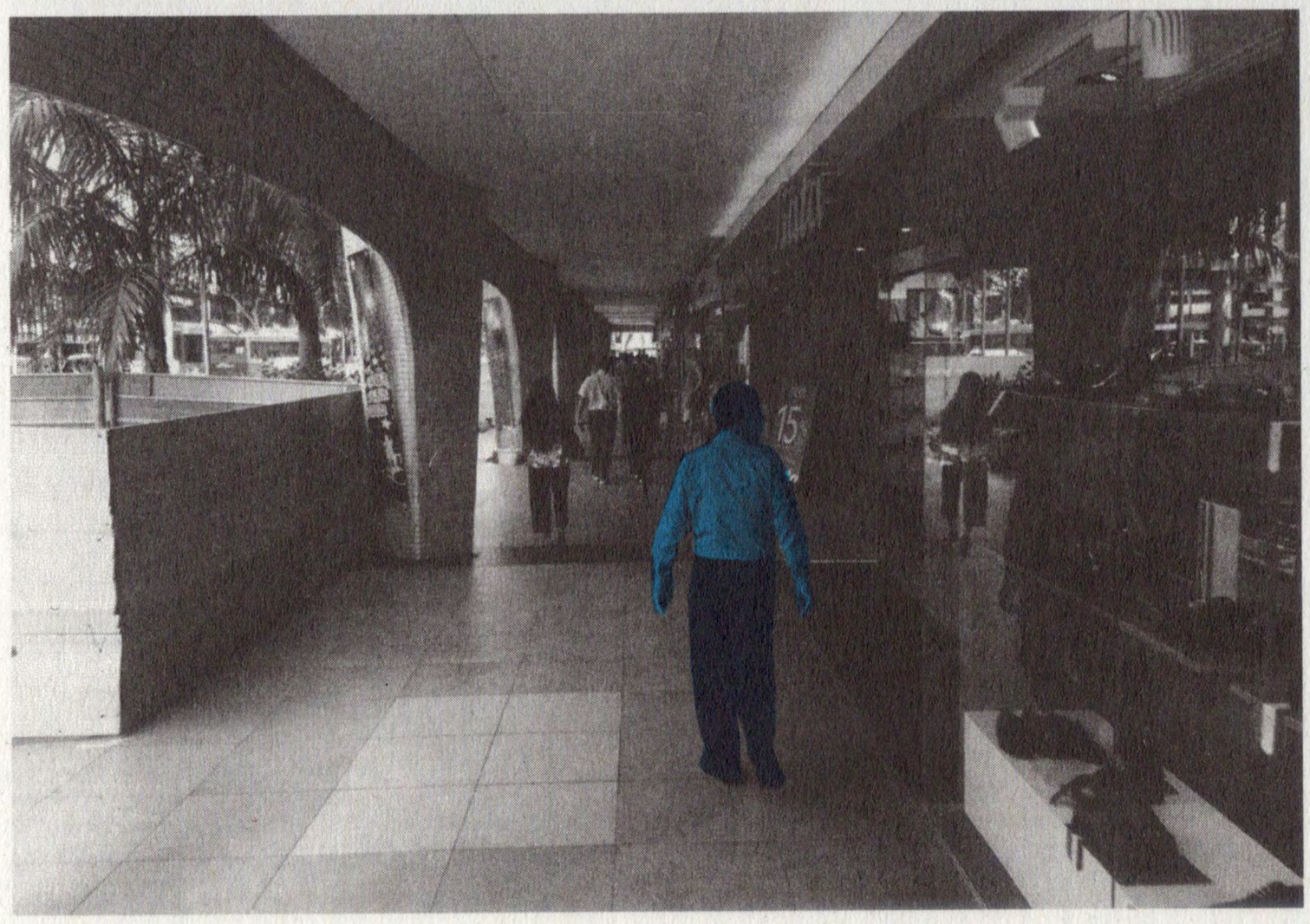
When the sun hangs low in the sky, light rays stretch long and far, effectively rendering the solid cover expected from porticoes useless. Pedestrians will have to depend on the visual presence of shadows to decide on their route.



Closing In

An advantage of walking on the innermost lane of porticoes is the encounter with cool air. There are several ways to extend the period of contact with air-conditioning (see Linger Longer), but the most common tactic is to pretend to window shop.



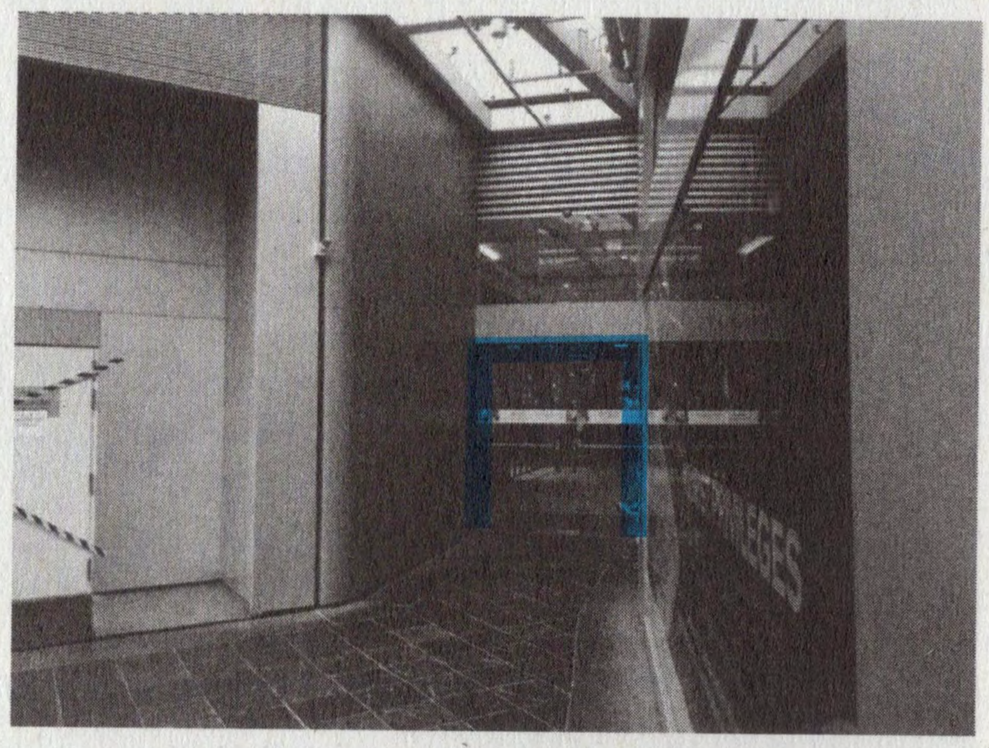


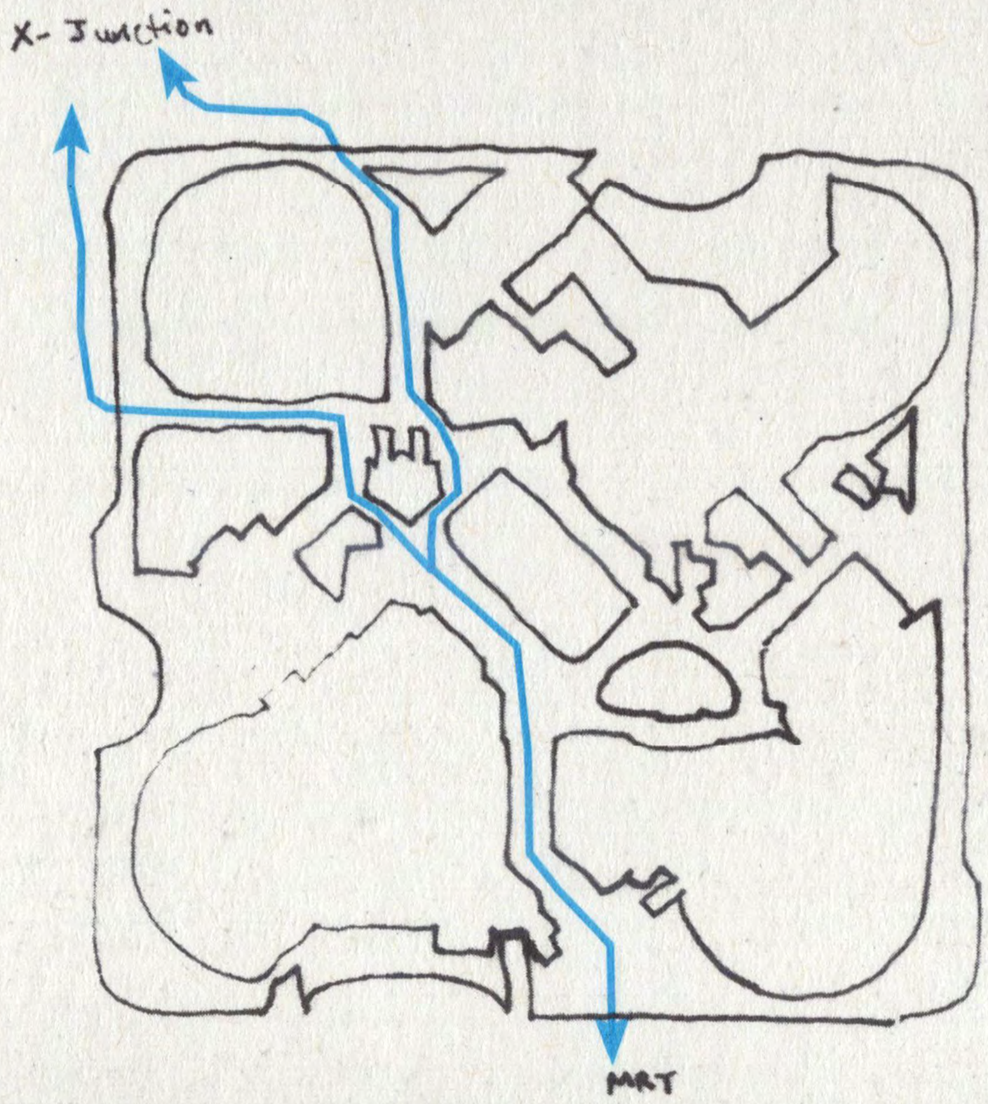
Linger Longer

There are certain situations during a walk when one is required to pause briefly: to pick up a phone call, retrieve something in a haversack, re-tie the shoelaces etc. In times like these, there is no better place to stop than near the entrance of air-conditioned buildings where sliding or swinging glass doors open and close frequently. Here, a man is seen positioned by the side of the doors, receiving the cool air without blocking the entryway. More shameless passers-by abandon all pretence and stand inside the department store to enjoy the cool, dry air.

Cool Cuts

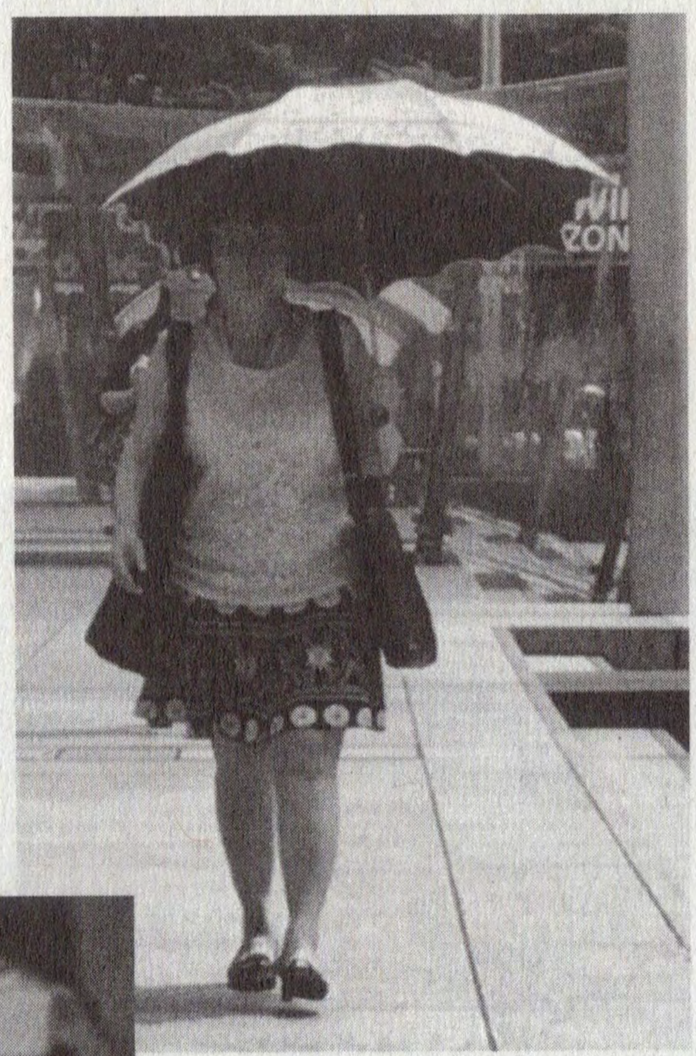
For people who commute daily, establishing a comfortable walking route is key. In Singapore, most routes involve cutting through air-conditioned buildings. Some of these paths are actually detours, which shows the compromises that have to be made to minimise contact with the outdoors.





Hang On

Frequently adjusting the shoulder strap of a bag can be considered one of the most covert methods to briefly introduce air into the underarm area.



Shop On

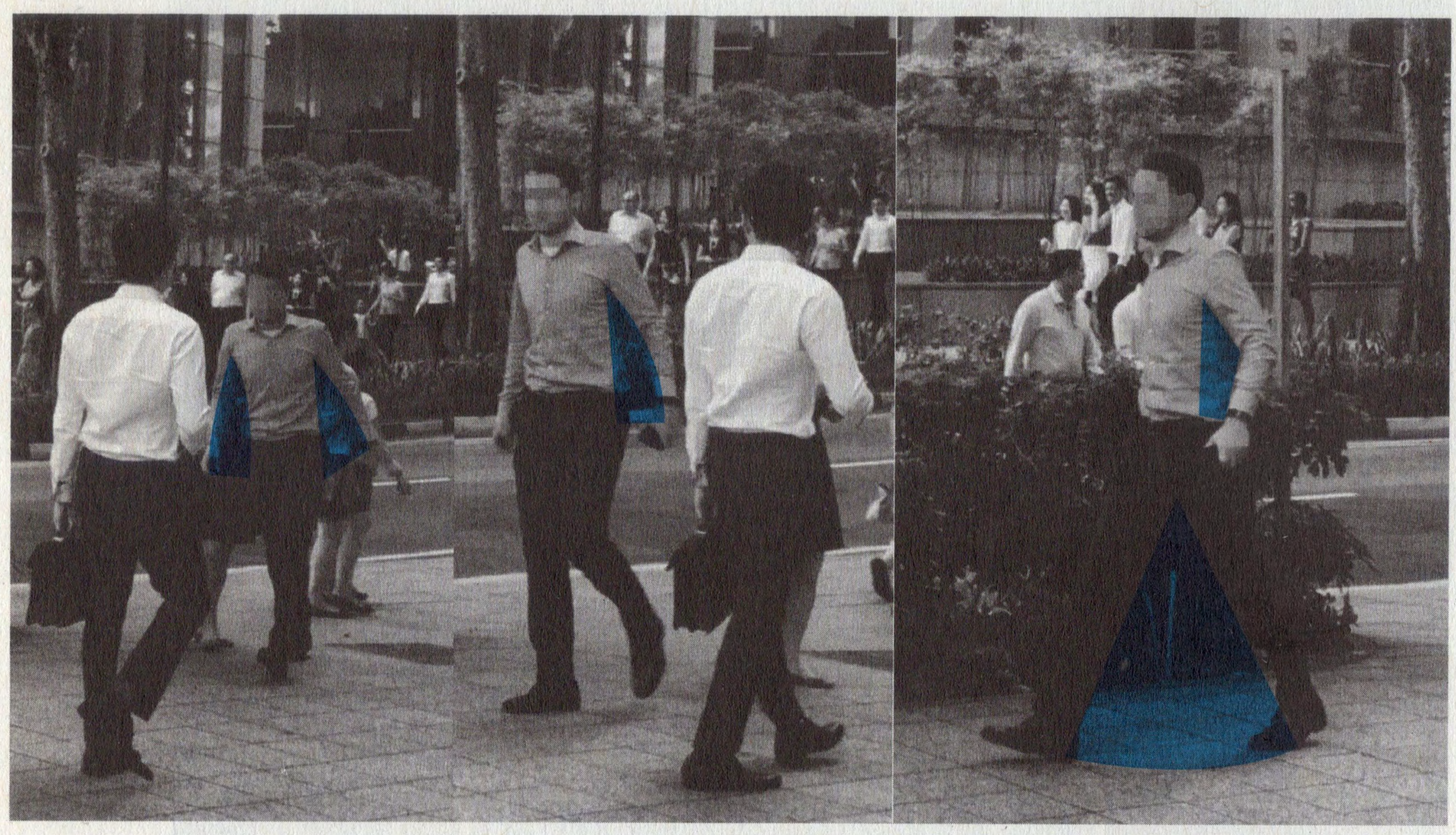
Carrying several large shopping bags can create an open upper body posture where air can freely circulate around the underarm area while giving the appearance of being an impressive consumer.

Walk, Don't Stop

When walking, some people avoid stopping altogether as a temporary pause forces the mind to focus on the heat. In contrast, continually walking produces the sensation of a breeze running through the body. To avoid coming to a complete stop, it is important to look ahead and read the traffic like this gentleman here. Aware that the traffic light is about to change, he slowed down, lingering just a little, before picking up his usual pace again at the first sign of the green man.

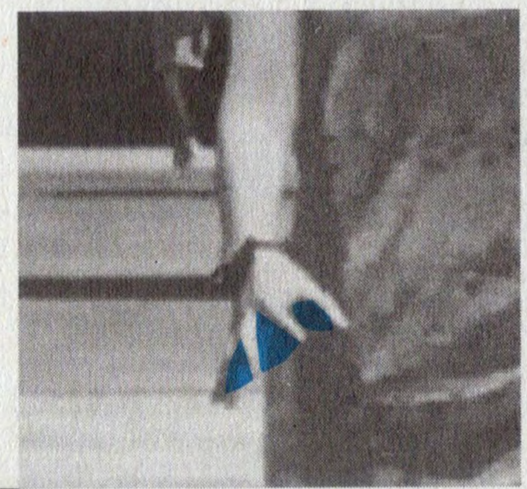
360°

At times, we come across individuals who walk with large exaggerated strides and wide-open arm swings that extend outwards from the body. This walking style may be perceived as arrogant or in bad taste, and while in some cases this swagger may be an accurate guide to the walker's personality, in most other cases, it would just be a perfectly innocent attempt to cool oneself by introducing maximum air flow throughout the body by dramatic movements.



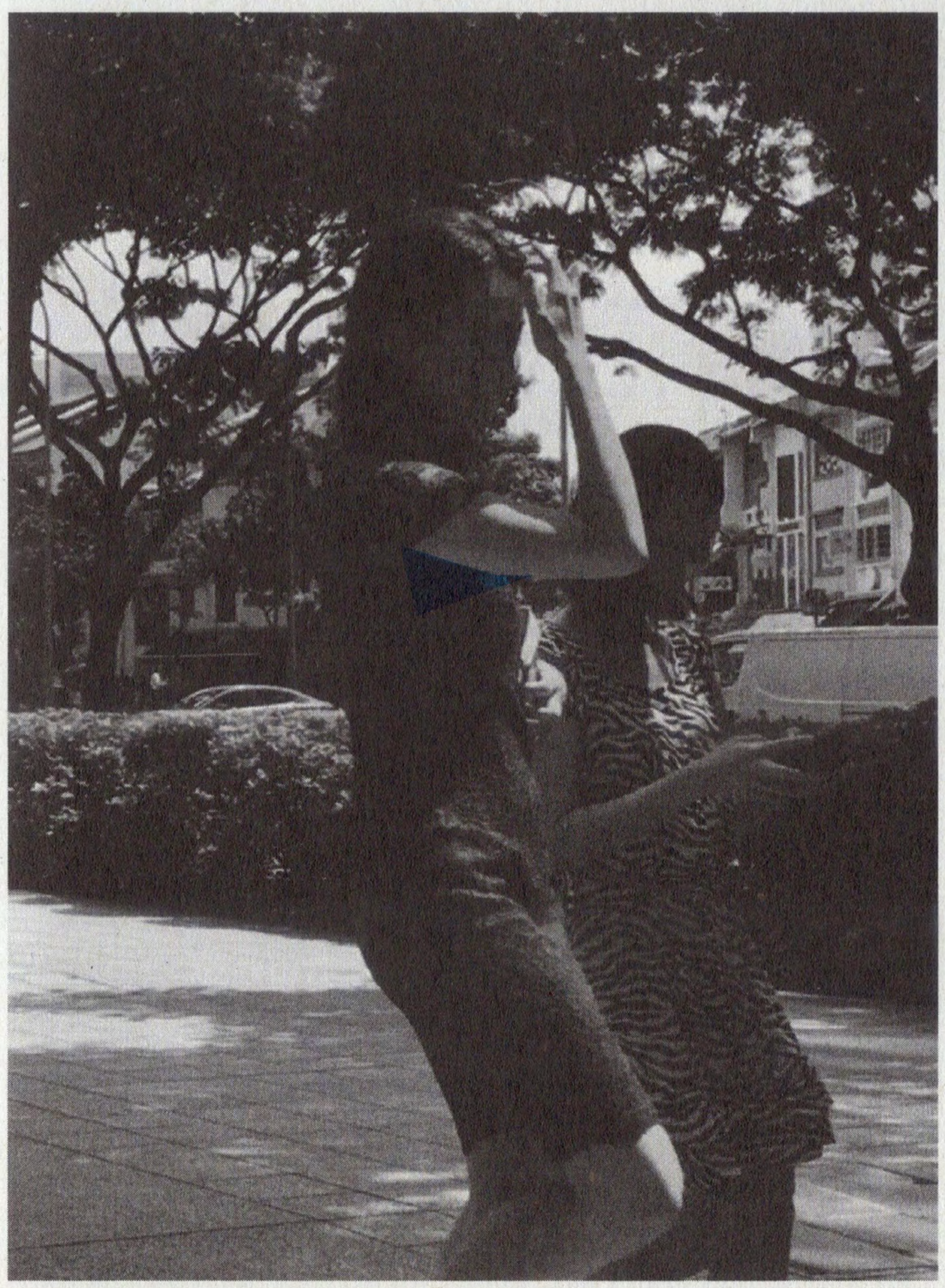
Swing Swing Swing

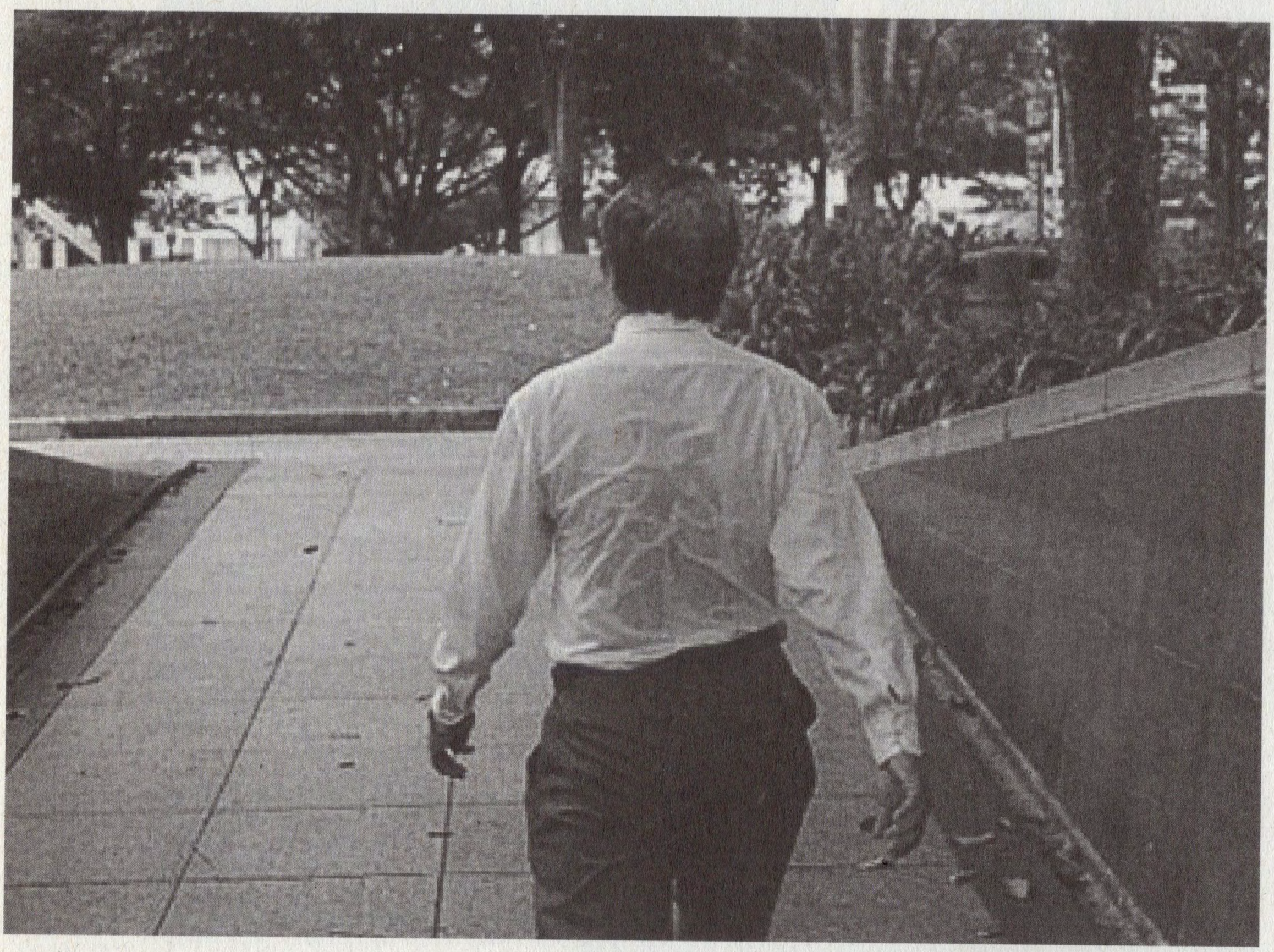
When walking, the arm swing is a subtle way of cooling oneself as air is constantly circulated around the moving arms. This is especially effective when the wrist area is unhindered by clothes sleeves or accessories. Pictured here, a woman has one arm preoccupied with a handbag, while the other arm makes a much wider swing radius than usual to double up the cooling efforts. Notice also how the fingers are spread wide apart each time the hand swings forward.



Sleight of Hand

The underarm has recurred several times throughout this study as the primary site where thermal cooling methods originate. This is of no surprise since public decorum often dictates how we should behave with our bodies and the underarm is simply the most accessible area of the body that can be easily 'exposed' and effectively cooled. One can discreetly ventilate the underarm by ruffling or combing the hair with fingers, scratching parts of the face, rubbing one eye, adjusting wearable devices around the head or gesticulating wildly while talking on the phone…





About Discipline the City

Cities mirror us. What happens when our city becomes over-designed and over-regulated? Is there still space for diversity, or does the city tend towards some vague notion of a model citizen? Who has the right to the city and who doesn't?

Sometimes, control is heavy handed — police, barricades, closed circuit cameras — but more often than not, it happens in the invisible seams of its architecture. It's the spikes in public spaces to discourage loiterers, the railings in void decks to stop kids from playing football, the hedges that grow outwards to prevent you sitting on the curb. We get so used to it that we don't realise how little agency we have. Or we do, and we are helpless.

At The Substation, artists work alongside architects, designers, historians, urban planners to examine the precarity of urban life. The city, in its imperfection, even unruliness, offers multiple possibilities for those unwilling to accept this helplessness. It's in the margins, the in-betweens, and the elusive public and civic spaces that we might find our individual and collective identity. That we might find ways to make the city ours.

About The Substation

The Substation is Singapore's first independent contemporary arts centre. Established in 1990 by the late Kuo Pao Kun, it is known for its pioneering and experimental arts programming. Over the years, The Substation has worked with some of Singapore's most critically acclaimed artists, writers and intellectuals including Alvin Tan, Goh Boon Teck, Amanda Heng, Lee Wen and Kok Heng Leun.

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The Substation

A Home for the Arts

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